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ABSTRACT

J. A. Banks (1981) developed a typology of ethnic identification that assumes that teachers can be described according to their openness to diversity from a multicultural perspective. This study investigates whether different treatments in preservice education courses and an inservice workshop would have an effect on the ethnic identification of teachers according to the Banks typology. The Teacher Student Instrument (TSI), a Likert scale based on the typology, was used as pretest and posttest with 14 preservice teachers in Group 1, 14 similar students in Group 2, and 65 participants in a summer workshop for teachers in Group 3. The research design for Group 1 and Group 3 was a posttest experimental group only design. Group 2 and Group 3 students were introduced to various definitions of multicultural education and were given instruction designed to increase their awareness of their own ethnic identification and other ethnicities. Levels of ethnic identification levels were similar for all groups at the end of the study. The mean score for each group was just below 4.0, indicating that these teachers and students were almost bicultural. However, 70% of the summer program teachers scored above 4.0, suggesting that they could function effectively in two cultures. In fact, they appeared to be doing so in the schools in which they taught. Further study is needed to establish the relationship between ethnic identification levels and interactions with students. (Contains 10 figures and 11 references.) (SLD)

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ED 397 203

The Stages of Ethnicity of Preservice Teachers and Inservice Personnel Involved in Multicultural Education Experiences

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Introduction

Research has shown that teacher expectation of student achievement can have an effect on the performance of students. In a review of recent literature dealing with the effect of teacher expectation on student performances, Stegemiller (1989) concluded from 31 articles he reviewed that teacher's expectations are communicated to students through differential treatment. Stegemiller further summarized that student characteristics such as social class, attractiveness, ethnicity, and gender influence teacher expectations. In addition, Rodney (1986) found that ethnicity, intellectual ability, and academic performance have the largest effects on teacher expectations. Results, gathered from 662 junior high school students and their teachers from 34 ethnic groups in Winnepeg Manitoba, implied that teachers are to a certain degree, sensitive to the cultural values of their students in setting both their normative and cognitive expectations.

Judge (1980) reported that a large percentage of 476 preservice teachers at Florida A & M University felt unprepared to deal with ethnically diverse groups of students. Judge balanced that these findings indicate a need for the additional education of teachers and preservice teachers in the area of ethnic diversity since 49% of his respondents reported a need for training in working with diverse groups.

Melnick and Raudenbusch (1986) found that differential treatment by "race" was clearly indicated by both experienced and preservice teachers. Judgement profiles of 54 experienced elementary teachers and 54 preservice elementary teachers were determined by having them respond to hypothetical teaching situations. The judgement profiles of

preservice and experienced teachers were remarkably similar, reflecting perhaps shared cultural or ideological views rather than effects of age, education, or classroom experience. In addition, Melnick and Raudenbusch (1986) concluded that differential teacher treatments are likely to lead to behaviors that convey messages which can have deleterious effects on student performances and outcomes.

Research by Morrison (1990) with 22 preschool classrooms suggested that some teachers may be unaware of the differential treatment given in their classrooms. In classrooms which had pupil populations with an ethnic group (Black or White) comprising less than 30 percent of the total enrollment, teacher interactions with that ethnic group were disproportionate to that of their majority peers. These observations according to Morrison (1990), imply that it is even more imperative that research should continue to focus on teacher-student interaction so that data on classroom interaction are available.

The overall purpose of this research was to investigate (1) preservice and inservice science teachers' stages of ethnicity and (2) the effect of treatments on the ethnic identification of preservice and inservice personnel. Teachers stage of ethnicity and ethnic identification are based upon Banks (1981) topology of ethnic identification. In Figure 1, six different multicultural science teachers are described. This topology assumes that teachers can be described according to their openness to diversity from a multicultural perspective (Ford, 1979). For example at Step 4, teachers possess the knowledge, psychological characteristics and skills to function in their own ethnic culture, as well as in another ethnic culture (Bennett, 1982).

Ethnicity has been defined in a variety of ways; it is the perception of the uniqueness of an ethnic group by a person. The acknowledgement of this uniqueness can be thought of as ethnic identification. An ethnic group is defined as "a collection of people with a common tradition and a sense of identify which exists as a subset of a larger society" (Banks & Banks, 1989, p. 34). The expressions of ethnicity that a group feels are conveyed from one generation to another (Baptiste, 1976, p. 65).

Atwater (1992) delineated the characteristics of multicultural science teachers based upon Banks' characteristics (1981). Multicultural science teachers possess the following characteristics: democratic beliefs, attitudes, and values; a clarified pluralistic ideology; a process of conceptualization of ethnic studies; the ability to view society from diverse cultural perspectives and points of view; knowledge of the emerging stages of ethnicity; knowledge of the complex nature of cultures in the United States; the ability to function at Bank's ethnicity stage of 4 or higher; strong science content and pedagogical backgrounds; and the science and pedagogical skills to teach all children science (see Figure 2). For science teachers to function at Banks' ethnicity Stage 4 or Martin and Atwater's Step 4 or higher, they must possess the attitudes, skills, knowledge, and commitment to participate both within their own culture and another cultural group. For example, in Georgia, science teachers should be able to function in at least the African American and White cultures.

Prior research findings have indicated that teachers' experiences do not influence teachers' perceptions about their students ethnicity or social class. In order for science teachers to become multicultural teachers, they should experience a multicultural science

teacher education program. This study investigates whether different treatments in preservice education courses and an inservice workshop would have an effect upon teachers' ethnic identification levels.

Insert Figure 1 about here

Insert Figure 2 about here

Methodology

Instrument

The Teacher Student Instrument (TSI) was used in this study. The TSI, developed by Margaret L. Ford, is a Likert scale instrument based on James Bank's topology of ethnicity. Two types of validation procedures were used by Ford. An expert panel examined the items in terms of ethnic identity as a construct and selected the final items to be incorporated into the instrument. An item analysis was utilized to determine the effectiveness of the instrument items at the 0.001 level of significance. During this process, 10 of the original 52 items were deleted. Secondly, construct validity was established by comparing the teachers' score on the TSI with predetermined socio-demographic factors. Therefore, a 42 item instrument was developed. In Table 1 are examples of statements to which the teachers responded on a continuum from strongly agree to strongly disagree. The possible range of scores on the TSI is 42 to 210.

Table 1 about here

Wyatt (1984) determined the reliability of this instrument with both a control and experimental group. She obtained a correlation coefficient of 0.89 and 0.91 from both the pretest and posttest data respectively. Internal consistency of TSI was established in this study by the use of a Cronbach Alpha; the alpha coefficient for the pretest scores of the 1992 preservice teacher group and posttest scores of another group of preservice science teachers was 0.86 and 0.90, respectively.

Samples

Group I consisted of preservice teachers enrolled in a science education course at a predominately White university in 1990. There were 19 people in the sample, but complete data were available for only 14.

Twenty-nine percent of the group were male. The ages of the group ranged from 21 to mid-forties. Most of the students were over 21 years old (see Figure 3). The ethnicity of the group was mostly White (see Figure 3). Seven students were enrolled in a bachelors program in secondary science education and seven were enrolled in a masters program in secondary science (see Figure 4). Few of the students were undergraduate science education majors (see Figure 4).

Insert Figure 3 about here

Insert Figure 4 about here

Group II was composed of preservice science teacher education students enrolled in a science education foundation course at the same predominantly White institution in 1991. There were 14 preservice teachers in this sample. Fifty-seven percent of the group were female. The ages of the group ranged from 21 to over 50. The second group of perservice teachers was similar to the first group in age, ethnicity and degree (see Figure 5 and 6).

Insert Figure 5 about here

Insert Figure 6 about here

The participants in Group III were involved in a summer workshop for teachers, counselors, and administrators in the 1991 Southeastern Consortium for Minorities in Engineering (SECME) workshop. Data were available for 66 participants. Forty-nine of the participants were females, while 14 were males (see Figure 7). Thirty-four percent of the participants were between the ages of 41 and 49; 48% of the participants were teachers, with the largest group composed of mathematics teachers (see Figure 8). African Americans and Whites made up 68.2% and 25.8% of the sample, respectively

(see Figure 9). The largest percent of the sample (55.9%) held master degrees, while the next largest percentage held bachelor degrees. Ninety-two percent of the participants were associated with either the middle or high school level (see Figure 10). Forty percent of the group had been teaching for 15 to 20 years (see Figure 10).

Insert Figure 7 about here

Insert Figure 8 about here

Insert Figure 9 about here

Insert Figure 10 about here

Procedures

The research design for the Group I was a posttest experimental group only design. The students were involved in a variety of multicultural education activities over a one quarter period of time during the fall quarter of 1990. Then, students were administered the TSI instrument. Some of these students then enrolled in science education method and curriculum course during the winter quarter. During the winter quarter, these

students were not involved in any specific multicultural education activities. At the end of the winter quarter, students were given TSI instrument again.

Group II preservice students were enrolled in a science foundation course during the fall quarter of 1991. Most of the students then completed the TSI instrument at the beginning of the winter quarter in science education methods and curriculum courses.

Group III teachers, counselors, and administrators were invited to a 1991 SECME summer workshop. A series of multicultural activities had been developed for these participants. All of the respondents were involved in these multicultural activities. The TSI instrument was given to the teachers, counselors, and administrators at the end of the summer workshop. Thus, a posttest experimental group only design was utilized.

Treatment for Groups I and II

The first day of the multicultural education component for Groups I and II, students were involved in an activity in which they begin to understand they do possess stereotypes. It is only when persons in powerful positions possess these stereotypes which become prejudices that discrimination takes place. Preservice teachers begin to understand that teachers are in powerful positions to raise havoc in students' lives.

Students are then introduced to the various definitions of multicultural education and the tenets of multicultural science education. It is stressed that multicultural education is beneficial to all students, especially White students. A brief discussion on the history of ethnic studies and the concepts of culture, melting pot, assimilation, and acculturation ensued.

Videotapes were also utilized as a teaching vehicle. The preservice science teachers viewed excerpts from the videotapes of James Boyer's speech at the 1989 Association for Teacher education national conference. Boyer provided them the opportunity to hear an African American parent react to the behavior of a White teacher in Kansas. In order to understand that the knowledge of students' culture is invaluable, the prospective teachers view excerpts from the film, *Stand and Deliver*. Jaime Escalante's understanding of the Mexican American culture is an aspect of the knowledge base that aided him in his success. The beginning of the videotape, the New ABCS: Preparing Black Children for the 21st Century, provided them the rudimentary knowledge of the contributions African Americans have made to science. Finally, these preservice teachers saw excerpts from the videotape, *Communicative Math and Science Learning*. Successful science programs for students whose second language is English are demonstrated. Cooperative learning, peer tutoring, cooperative teaching, use of hands-on activities, and practice with communicating in English are some of the successful strategies employed in these programs. This video demonstrated that it is possible to teach science to limited-English-proficient students.

Cognition was another area of discussion. How do students learn? What do we know about ways of knowing and what do we know about ways of knowing and culture? Preservice teachers assessed their own ways of learning through the use of a computer program. A lengthy discussion took place on learning styles of students and teachers.

By this time, students are ready for their practicum experience. For two to three weeks, they observe and teach at least small groups of students in either middle or high

schools. After performing a discrepant event activity among themselves; they presented this discrepant event to students in a precollege setting. One of their assignments is to interview two students during the classroom practicum. The following criteria must be met by the two interviewees. At least one must be African American, Asian American, Hispanic, or Native American. One student must be performing above average in the classroom, the other must be performing at average or below average level. The case studies are to be presented in a written form. It is noteworthy that few of the preservice teachers select African American students who are doing well in school. However, these prospective teachers do reveal that they obtain knowledge that the cooperating teachers do not possess.

Upon return to the university, the teachers relate their experiences. A discussion on seating arrangements is initiated when Atwater shows them a quote by Tiedts and Tiedts. How important is seating arrangement to students' achievement and comfort level in science classrooms.

What kinds of student-teacher interactions have they observed during their practicum? Why were interactions successful and others were not? Finally, a field trip to Benjamin Mays High School in Atlanta is in order so that these preservice science teachers can see that many African American students are being successful in school and science classes. During this field trip they had the opportunity to talk with both students and teachers at this school.

A rationale paper is used as an assessment of students' philosophy about science teaching and learning. In the rationale paper, they discuss the the following: (1) their

reasons for choosing science teaching (includes their ideas about what is science); (2) their goals for their science students; (3) a description of how they will create a supportive environment for all of their students with the use of different teaching behaviors and strategies; (4) and their evaluation tools they will use to assess their students' learning and their own teaching effectiveness. An oral final examination is given to each of these students. The final oral examination consists of questions related to the rationale paper and at least one question deals with multicultural education. The first quarter has ended; the first part of the multicultural education strand is completed.

Treatment for Group III

Group III was involved in a summer workshop for teachers, counselors, and administrators in a SECME 12-day workshop during the summer of 1991 in a southeastern state. Many of these teachers had attended other SECME workshops, but this was the first workshop with an emphasis on multicultural education. During the workshop, there were five multicultural education presentations given to the group by five different experts. The first presentation took place on the third day of the workshop. The presentation lasted three hours. The topic of the presentation was "Implications for Multiculturally Responsive Teaching".

The second presentation dealt with the implications for multiculturizing science and mathematics. This session took place on the fourth day of the conference for a period of three hours.

On the eighth day, a presentation on teaching strategies to enhance multicultural education was presented to the group over an hour and a half period. Two sessions were

presented on the last day. Each session was 1 1/2 hours. The topic of the first session was "Teaching in a Multicultural Setting and Its Implications for Hispanic Students". The last session presented strategies for multicultural teaching.

Data Analysis

Descriptive statistics were used in this study. The total score on the TSI was calculated for each individual, along with an ethnicity level score. Ethnicity level score was determined by dividing the student's score on the TSI instrument by the total possible score. The ethnicity level score, according to Ford (1979) represents the stage of ethnicity for the teacher on Banks' ethnic identification topology. Preservice teachers and inservice educational personnel in Stages 1 and 2 probably would find diversity threatening. Science teachers in Stage 4 would welcome diversity and would teach science to accommodate the many ways of learning in their classrooms. Teachers in Stage 5 would have reached the ideal for multicultural science teachers.

Results

Group I

The mean score of Group I participants after the treatment was 160.8 with a standard deviation of 13.8. The scores ranged from 125 to 188. The mean of the ethnic level score for Group I was 3.8 with a stand deviation of 0.11. The ethnic level scores ranged from 3.0 to 4.5. Therefore, the preservice science teachers had at least accepted themselves and clarified their attitudes toward their own ethnic group. Females in Group I had an average total ethnic identification score of 155.2 with an average ethnic level score of 3.7; the mean of the same score for the males was 173.5 with an average

ethnic level score of 4.1. The ethnic level scores of 43% of this sample was higher than 4.0 with only 7% of the sample with an ethnic level score below 2.0.

Group II

The pretest mean scores of Group II preservice teachers was 160.8 with a standard deviation of 13.8. The scores ranged from 142 to 184. The mean of the ethnic level scores for this same group was 3.8 with a standard deviation of 0.33. Thus, the preservice teachers were accepting of self and felt positively toward their own ethnic group. Females in this sample had an average total ethnic identification score of 159 with standard deviation of 12; their an average ethnic level score was 3.8 with standard deviation of 0.3. While the mean score for the males was 163.8 with a standard deviation of 16.6. The average ethnic level score of the males was 3.9 with a standard deviation of 0.4.

The ethnic level score of 35.7% of the sample was higher than 4.0 with no one scored below 3.0. Fifty percent of the African American teachers had an ethnic level score of 4.0 or higher, while 70.5% of the White teachers had an ethnic level score of 4.0 or higher.

Since the posttest was administered to Group II at the beginning of the winter quarter, the composition of the group had changed. The pretest and posttest scores were only available for four preservice teachers in Group II. Therefore, the sample was too small in order to do any additional data analysis.

Group III

Data were complete for 65 participants in the science summer workshop. The means scores of the total ethnic identification and ethnic level scores were 162.4 with a standard deviation of 25.6 and 3.9 with a standard deviation 0.61, respectively. No statistically significant difference was found between the males and females in this sample. Only 6.2% of this sample had an ethnic level score less than 3.0, 56.9% of the sample had an ethnic level score of 4.0 or greater. No significant differences were not found between gender, years of teaching, levels of teaching, and mathematics and science teachers.

Conclusions and Implications

Regardless of the groups, the ethnic levels were similar. The mean score for each group was just below 4.0 which indicates that the teachers are almost bicultural. However, a few these preservice and inservice teachers were at ethnic level of two. Most of the teachers were in this study were monocultural in their classrooms since, only 36% of the preservice teachers and 56.9% of the inservice participants were predicted to be able to function in two cultures. Most of the preservice Whites teachers in this study were below 4.0 before or after the treatment; this finding indicates that these preservice teachers share similar cultural and ideological views. A longer exposure to diversity might influence their ability to interact with different groups of students. Since 70% of the White SECME teachers scored above 4.0; they appear to be able function in two cultures. This is not surprising since these teachers must work effectively with African American and Hispanics/Latinos students to meet the goals of this project.

The results of this study with science teachers support the findings of other studies for other kinds of teachers. However, further studies are needed to establish the relationship between ethic identification levels and interactions with students. Do teachers who are at levels one and two interact differently with students than teachers on levels three, four and five? Are different levels of science questions asked to different students in the classroom? Is differential science learning taking place in the classroom based upon teachers' ethnic identification levels? Answers to these questions are needed so that further insights in the area of multicultural science education can be gained.

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Figure 1. Types of science teachers.

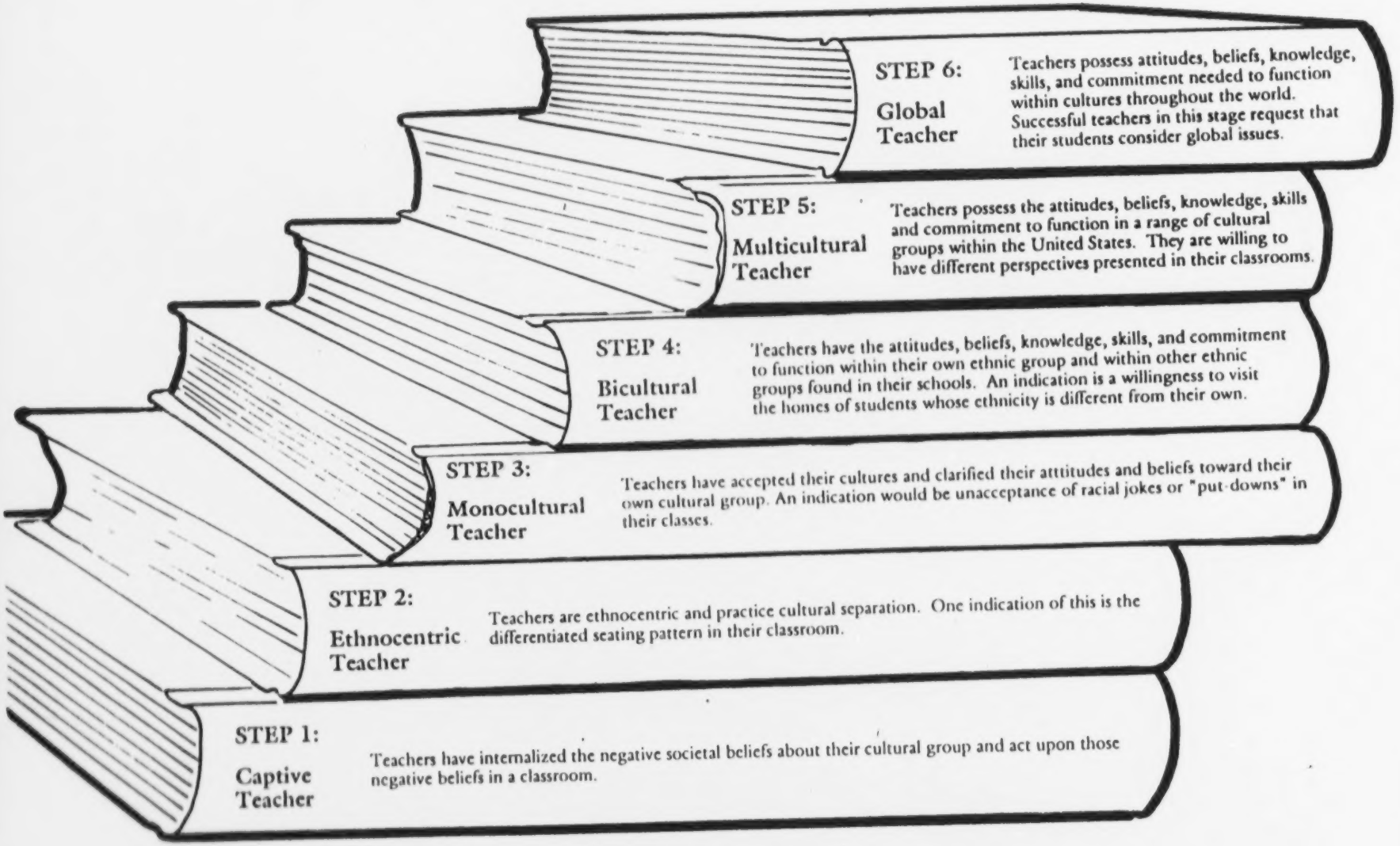
STEP 6:
Global Teacher
Teachers possess attitudes, beliefs, knowledge, skills, and commitment needed to function within cultures throughout the world. Successful teachers in this stage request that their students consider global issues.
STEP 5:
Multicultural Teacher
Teachers possess the attitudes, beliefs, knowledge, skills and commitment to function in a range of cultural groups within the United States. They are willing to have different perspectives presented in their classrooms.
STEP 4:
Bicultural Teacher
Teachers have the attitudes, beliefs, knowledge, skills, and commitment to function within their own ethnic group and within other ethnic groups found in their schools. An indication is a willingness to visit the homes of students whose ethnicity is different from their own.
STEP 3:
Monocultural Teacher
Teachers have accepted their cultures and clarified their atttitudes and beliefs toward their own cultural group. An indication would be unacceptance of racial jokes or "put-downs" in their classes.
STEP 2:
Ethnocentric Teacher
Teachers are ethnocentric and practice cultural separation. One indication of this is the differentiated seating pattern in their classroom.
STEP 1:
Captive Teacher
Teachers have internalized the negative societal beliefs about their cultural group and act upon those negative beliefs in a classroom.

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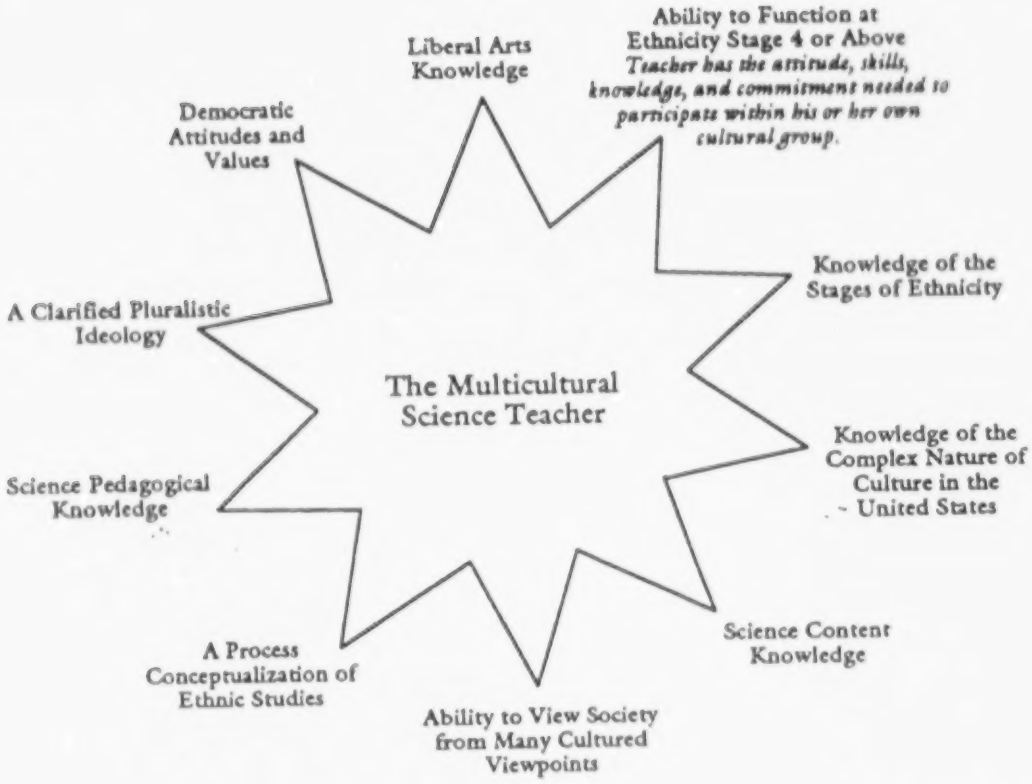
Figure 2. Characteristics of the multicultural science teacher.


Liberal Arts Knowledge
Ability to Function at Ethnicity Stage 4 or Above
Teacher has the attitude, skills, knowledge, and commitment needed to participate within his or her own cultural group.
Democratic Attitudes and Values
Knowledge of the Stages of Ethnicity
A Clarified Pluralistic Ideology
The Multicultural Science Teacher
Knowledge of the Complex Nature of Culture in the United States
Science Pedagogical Knowledge
Science Content Knowledge
A Process Conceptualization of Ethnic Studies
Ability to View Society from Many Cultured Viewpoints

Characteristics of the Multicultural Science Teacher

To teach effectively in multicultural environments, the science teacher must possess democratic attitudes and values, a clarified pluralistic ideology, a process conceptualization of ethnic studies, the ability to view society from diverse ethnic perspectives and points of view, knowledge of the emerging stages of ethnicity, knowledge of the complex nature of culture in the United States, the ability to function at Bank's Ethnicity Stage 4 or above, a strong science content and pedagogical background, the science and pedagogical skills to teach all students and liberal arts knowledge. Science teacher education programs must be changed so that their science teachers acquire these attitudes, conceptual frameworks, knowledge and skills.

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Figure 3. Age and ethnic composition of group 1.

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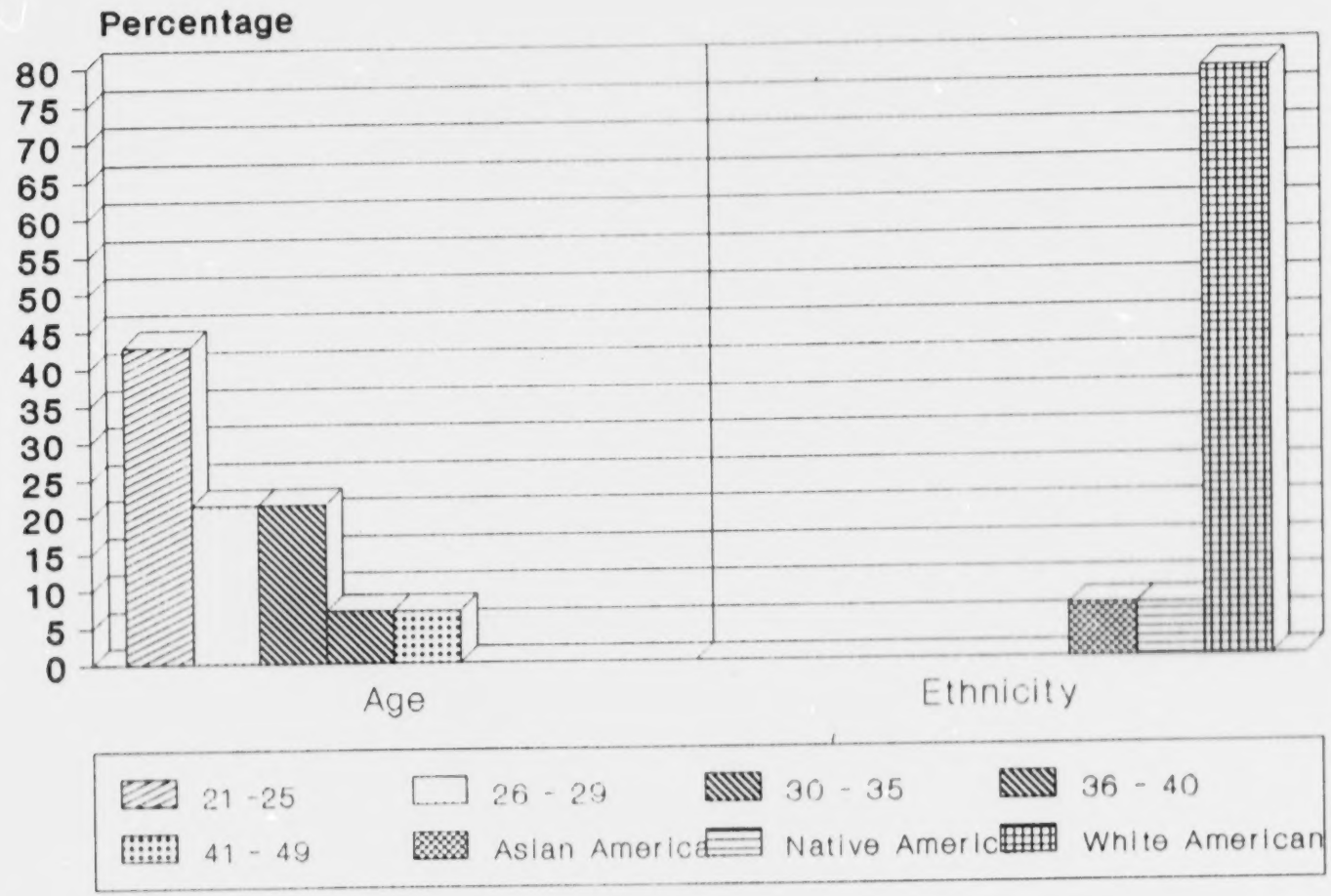

Figure 4. Degree program and present degree of group 1.

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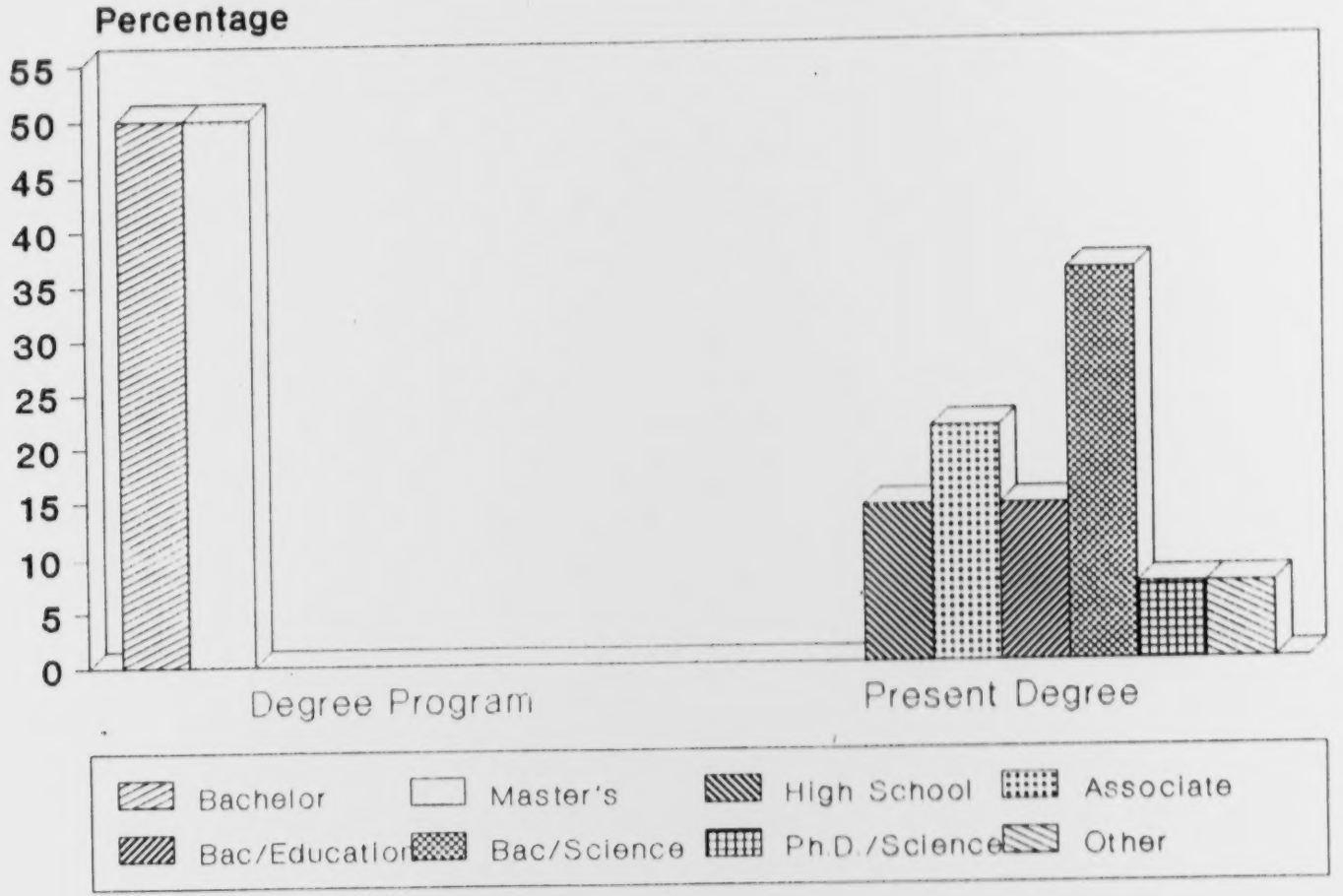

Figure 5. Age and ethnic composition of group II.

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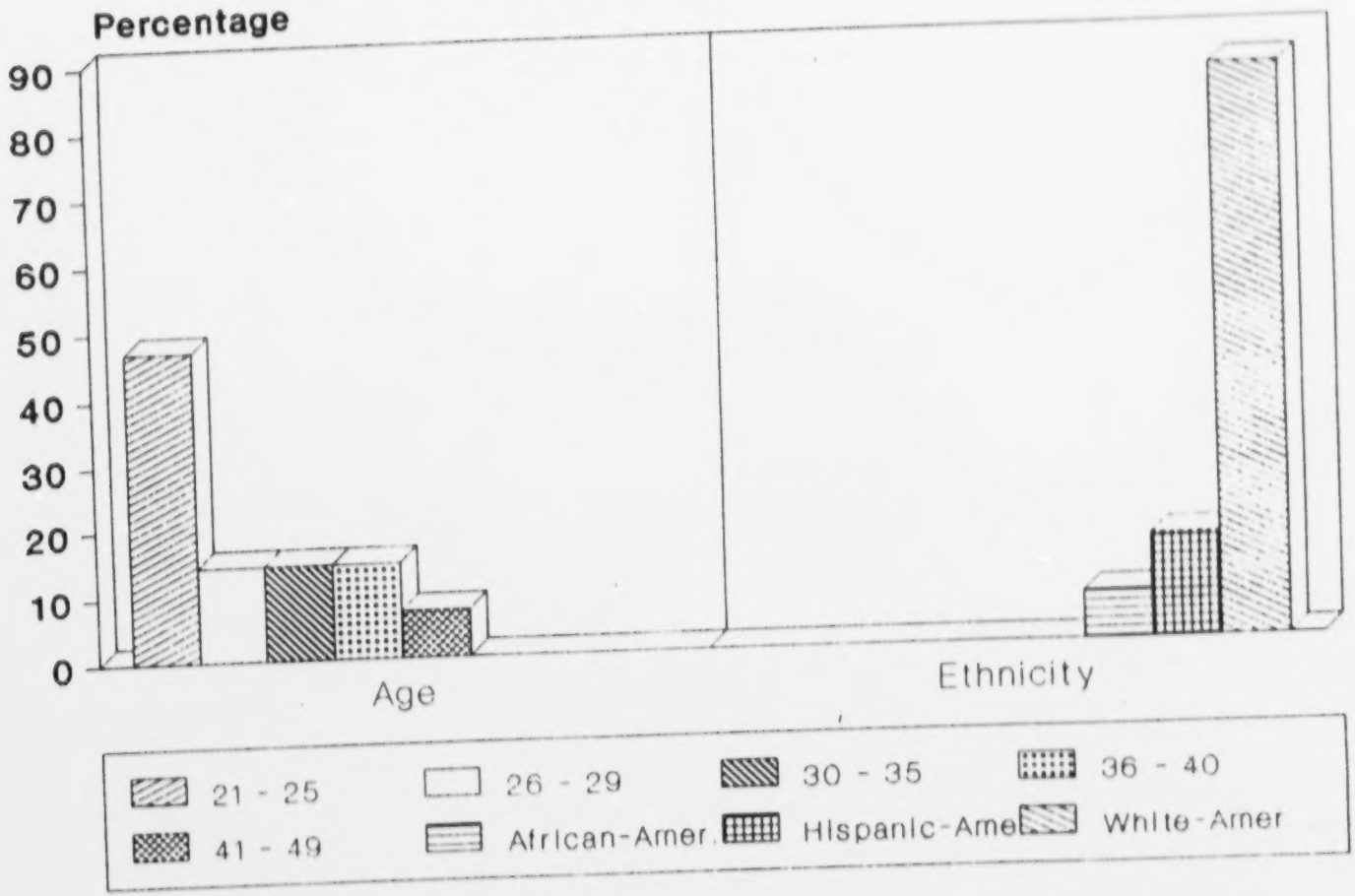

Figure 6. Degree program and present degree of group II.

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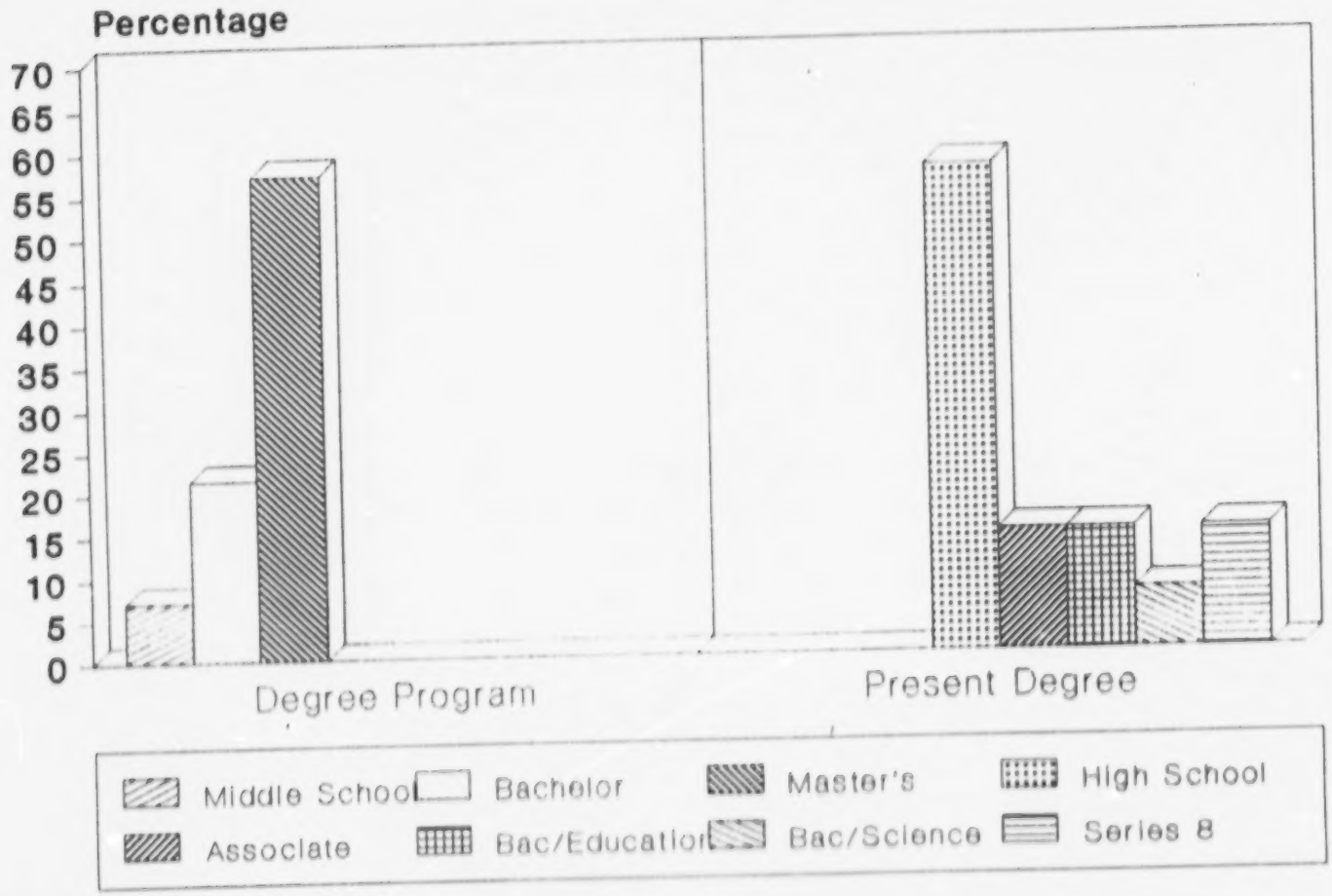

Figure 7. Gender and age composition of group III.

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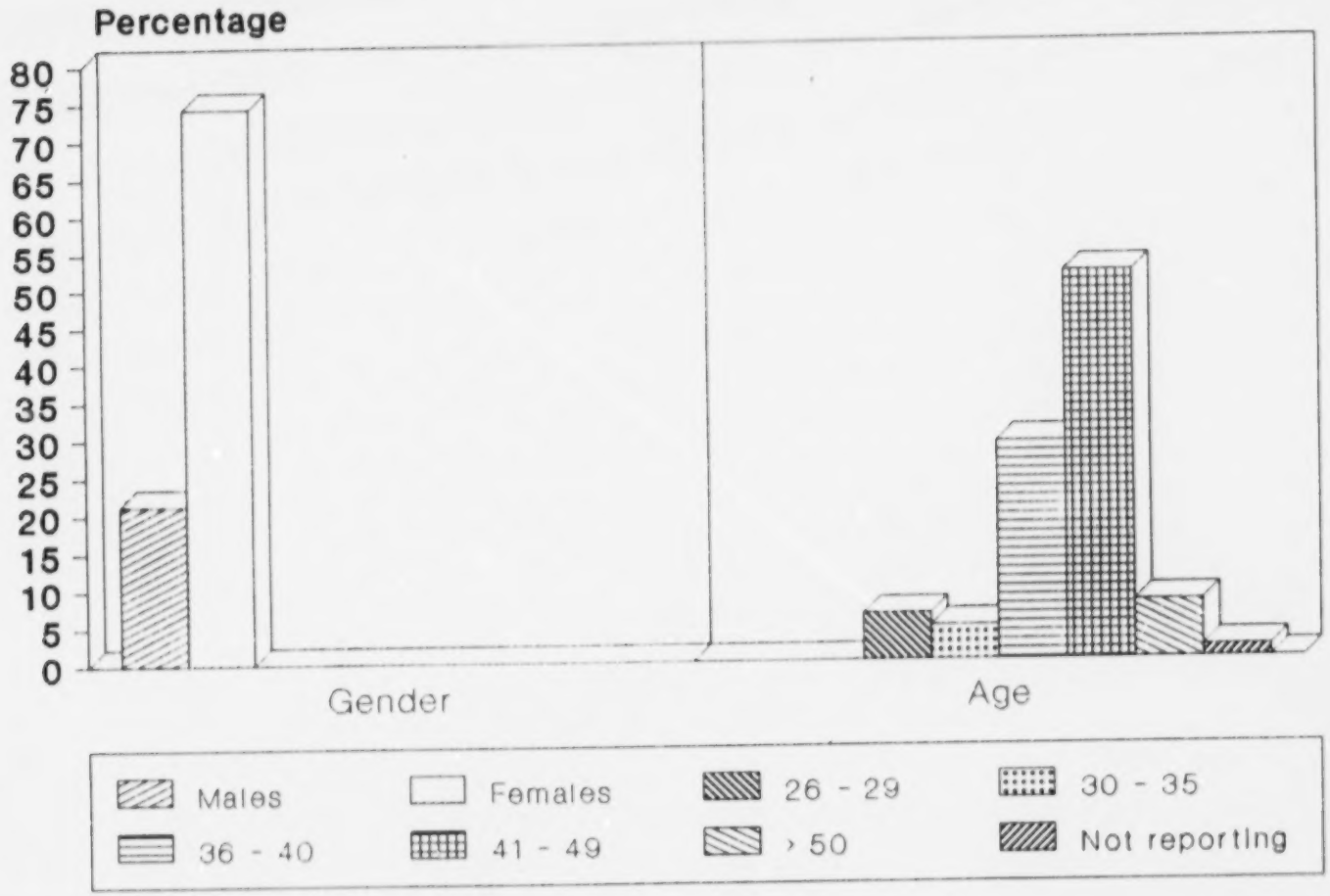

Figure 8. Teaching responsibilities of group III.

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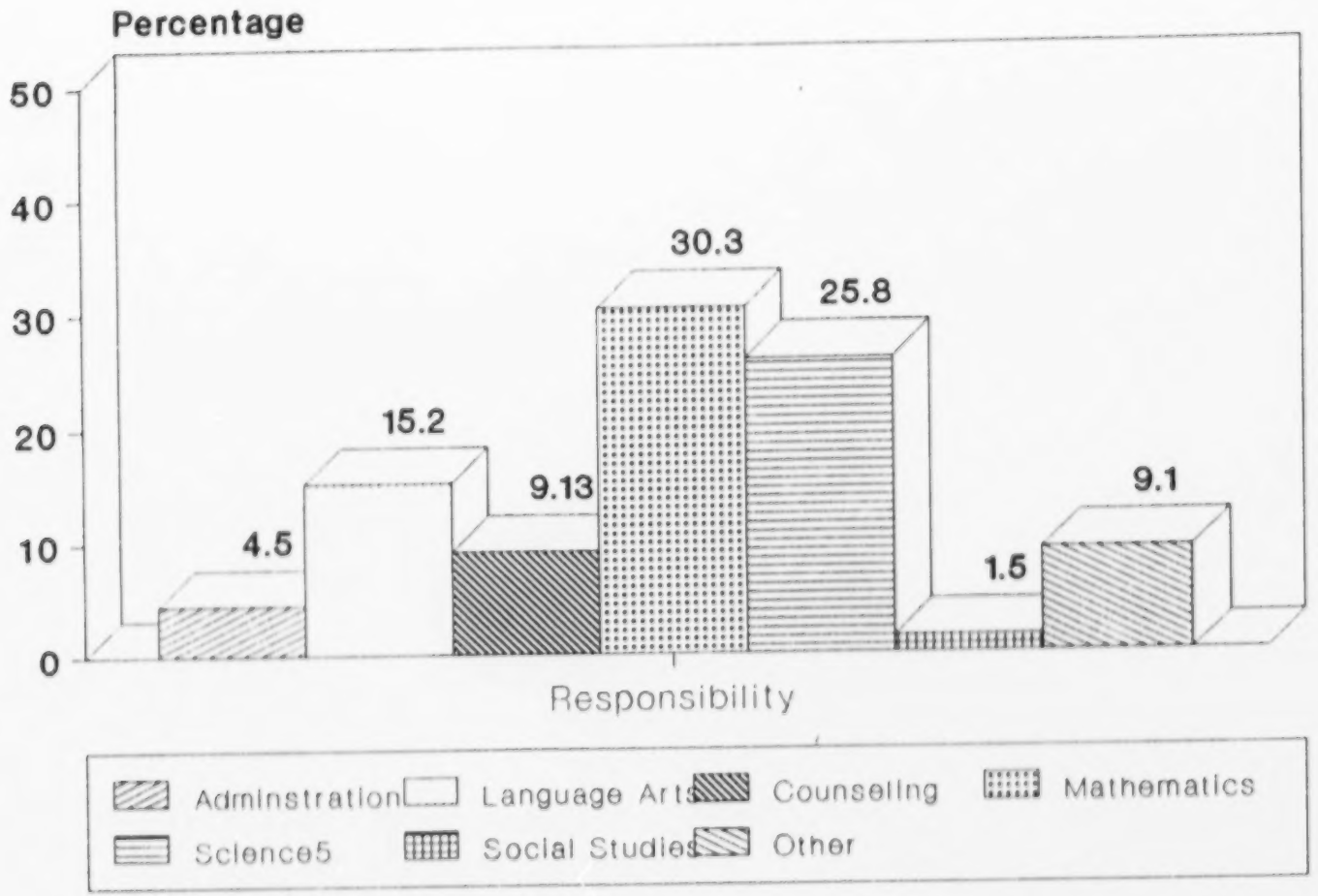

Figure 9. Ethnicity and teaching certification of group III.

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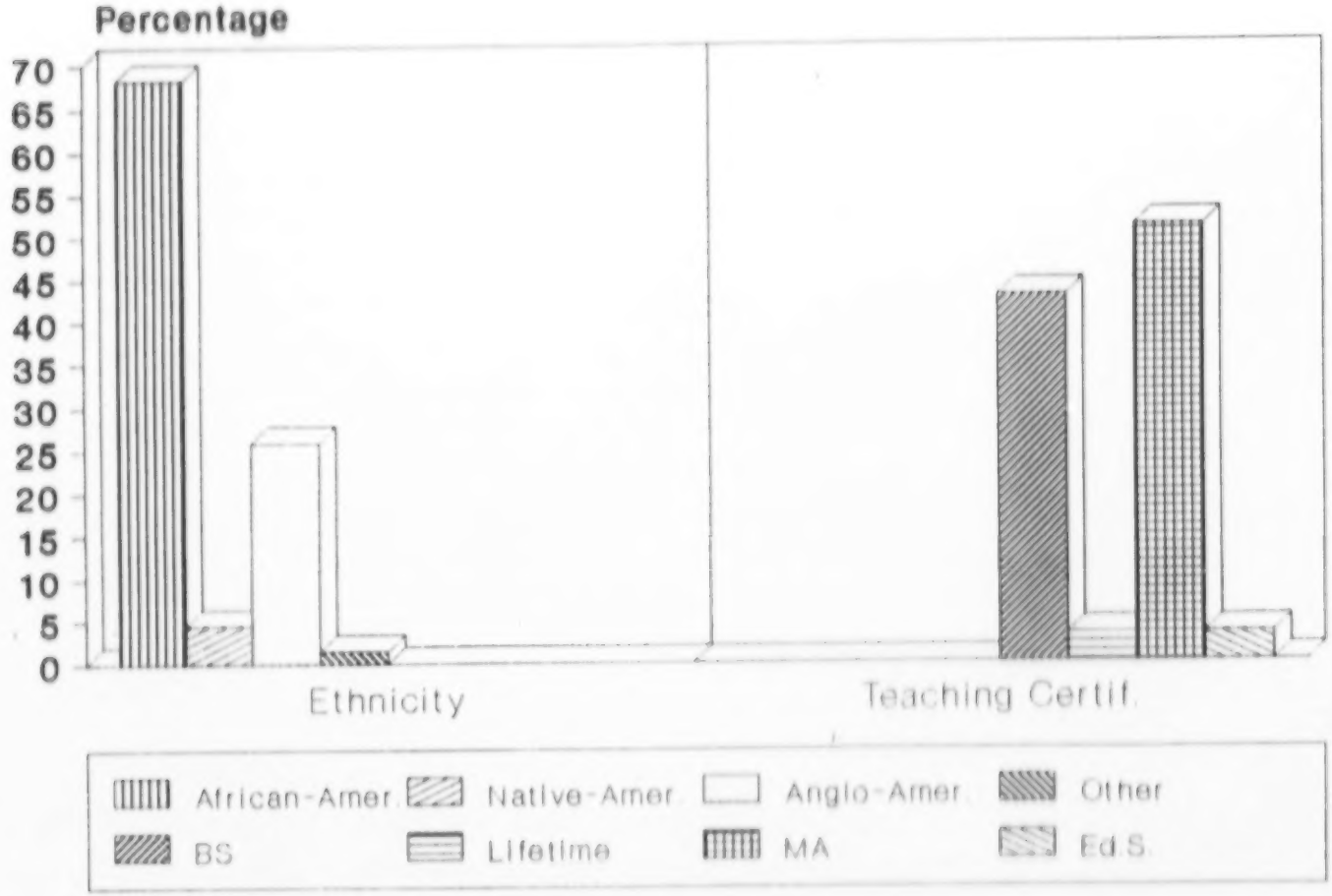

Figure 10. Teaching level and experience of group III.

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